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M/047/0096
April

OCT 07 2014

Mr. Barclay Cuthbert
U.S. Oil Sands
Suite #1600, 521 – 3rd Avenue SW
Calgary, AB T2P 3T3
Canada

Dear Mr. Cuthbert:

Subject: SPLP Analytical Results for Oil Sands and Tailings, PR Springs Mine, Uintah and Grand Counties, Utah

The Division of Water Quality (DWQ) has reviewed the information submitted by Doug Thornton on August 18, 2014 on analytical results for testing samples of tailings from the PR Springs Mine. The intent of this sampling was to identify contaminants that could leach out of the tailings from contact with precipitation. When Earth Energy Resources, U.S. Oil Sands' predecessor, submitted a request for determination of permit-by-rule status for the PR Springs mine in 2008, information on the chemical characteristics of the mine tailings was provided based on analysis of samples from the Asphalt Ridge tar sands deposit near Vernal rather than from PR Springs samples. Tar sands refining was not operating at PR Springs at the time and site specific samples of PR Springs tailings could not be obtained. DWQ approved the permit-by-rule status for tailings disposal on the basis that the Asphalt Ridge samples would provide a representative analog to PR Springs samples; however, DWQ also requested that samples of PR Springs tailings be analyzed when they became available.

The original samples were analyzed using a Toxicity Characteristic Leaching Procedure (TCLP) extraction. Because this extraction method uses an acidic extraction solution intended to mimic conditions within a municipal landfill, DWQ does not consider TCLP extraction to be representative of conditions that prevail in the PR Springs area, where evidence indicates that water reacting with rocks in that area would be alkaline. Instead, DWQ prefers to use the Synthetic Precipitation Leaching Procedure (SPLP), which uses an extraction liquid of deionized water with pH adjusted to 5.0, intended to mimic precipitation. It should be noted that no laboratory analytical method can predict the concentrations of contaminants that would be present in leachate generated under actual field conditions; the intent is to identify which contaminants would be present in leachate and to have a standard for comparison between different samples, because the same extraction procedure is used.

U.S. Oil Sands submitted analytical results for three sample types from PR Springs:

1) Un-refined, naturally-occurring tar sands ore;
2) Coarse sand tailings; and
3) Clay fines tailings.

The results of the analyses show that the SPLP extract solutions had the following.

Low levels

- total organic carbon
- total petroleum hydrocarbons- gasoline and diesel range organics
- toluene, oil and grease; and

Non-detectable levels

- Volatile organic compounds
- Semi-volatile organic compounds
- Metals from Table 1 of UAC R317-6, and
- Fluorine.

All contaminants present in the tailings samples were also present in the unprocessed tar sands and the highest levels of leachable contaminants were in the clay fines tailings.

These results are consistent with those reported for the TCLP extractions used in Earth Energy Resources' 2008 Demonstration, and do not change DWQ's determination that disposal of these tailings according to U.S. Oil Sands' mine plan (burial in the unsaturated zone) qualifies for permit-by-rule status under UAC R317-6-6.2.A(25), by having *de minimis* actual or potential effect on ground water quality.

This permit-by-rule determination only applies to tailings with similar chemical characteristics disposed at the PR Springs mine site by burial in the unsaturated zone. If any of these factors change or if U.S. Oil Sands starts a new mining operation at another site, a new evaluation of whether the tailings disposal still qualifies for permit-by rule status will have to be made by DWQ.

If you have any questions about this letter or permit-by-rule status, please contact me at (801) 536-4358 or at mnovak@utah.gov.

Sincerely,

Mark C. Novak

Mark Novak, P.G., Environmental Scientist
Ground Water Protection Section

MN:pe

cc: Paul Baker, DOGM
Scott Hacking, District Engineer

DWQ-2014-012625